Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: April 2004

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. The monthly reports summarizing channel water salinity conditions are submitted for October through May of the following calendar year in accordance with SWRCB requirements. Conditions of channel water salinity in the Suisun Marsh are determined by specific electrical conductivity and specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

This report is required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	Northern Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

In addition, data from the stations listed below are also included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area precipitation, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on condition that may affect channel water salinity in the Marsh.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of April, 2004, salinity conditions at all five compliance stations were in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of April was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for the eastern and western compliance stations was 11.0 mS/cm during April 2004. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is as shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Compared to March, April outflow was one-third the amount. Delta outflow for this month varied from a low 11,947 cfs to a high 30,434 cfs as shown in Figure 3. Outflow started off low, about 15,000 cfs and increased to about 30,000 cfs on April 9. The increase was a result of upstream releases to meet Delta salinity standards. Outflow held steady at 30,000 cfs until April 19, then declined thereafter to about 11,400 cfs by the end of the month. During this month, only two precipitation events occurred. Outflow became steady at 25,000 cfs on April 20 and 21, rather than declining due to the 0.05 inches and 0.11 inches of precipitation events on April 19 and 20, respectively. Thereafter, no precipitation activity occurred for the rest of the month.

The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for April is listed below:

Month	Mean NDOI (cubic feet per second)
April	21,952

2.3 Rainfall

For the month of April, only 2 precipitation events occurred and ranged from a low of 0.05 inches to a high of 0.11 inches. Overall, there were very small amount of precipitation activity this month.

Total monthly rainfall at the Waterman Gauging Station in Fairfield during April 2004 is listed below:

Month	Total Rainfall (inches)
April	0.16

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock configuration at the SMSCG from December 15, 2003 and through end of April 2004 are summarized below.

Date	Gate status	Flashboards status	Boat Lock status
April 1 - 30	3 gates open	Installed	Closed

The salinity control gates were not warranted to operate and continued to remain open during April because of low salinity levels throughout the marsh. This is expected to be the case in the coming months unless water quality condition changes and warrants re-operation of the gates or gate operations ceased entirely because of continued low salinity levels in the marsh.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,

- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

Despite low outflows compared to prior month, salinity levels at all compliance station remain remarkably low. Throughout the month, salinity levels at all compliance stations were below 3.5 mS/cm, and similarly at monitoring stations, the salinity levels were below 4.5 mS/cm. The standard for the month was 11.0 mS/cm, and both compliance and monitoring stations were well below the standard. The slight salinity level increase event at Sunrise Club (S-21), Volanti (S-42), and Morrow (S-35) in early April is probably due to tidal effect and/or local influences. Salinity levels at other compliance and/or monitoring stations did not record such conditions because salinity levels at these stations are already too fresh that any tidal influence would have minimal to no affect at the time.

Channel water salinity conditions in the marsh were observed to be influenced by antecedent conditions of past months high outflows.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for April 2004 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations were similar to that of April 1995, but with slightly higher magnitude. Comparing to the previous nine years, the following observations are made for each of the stations salinity levels for April 2004:

- C-2 salinity level was similar to that of 2003 and fifth highest

- S64 salinity level was similar to that of 2001 and sixth highest
- S49 salinity level was similar to that of 2000 and fifth highest
- S42 was the same as 2000, and was fourth highest
- S21 was the same as 2000, and was the fourth highest
- S97 was the fourth highest
- S35 was the fifth highest

Overall, April 2004 salinity levels were ranked fourth in past nine years in terms of high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

April 2004

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.3	11.0	Yes
S-64	0.8	11.0	Yes
S-49	2.1	11.0	Yes
S-42	2.6	11.0	Yes
S-21	2.6	11.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
April 2004

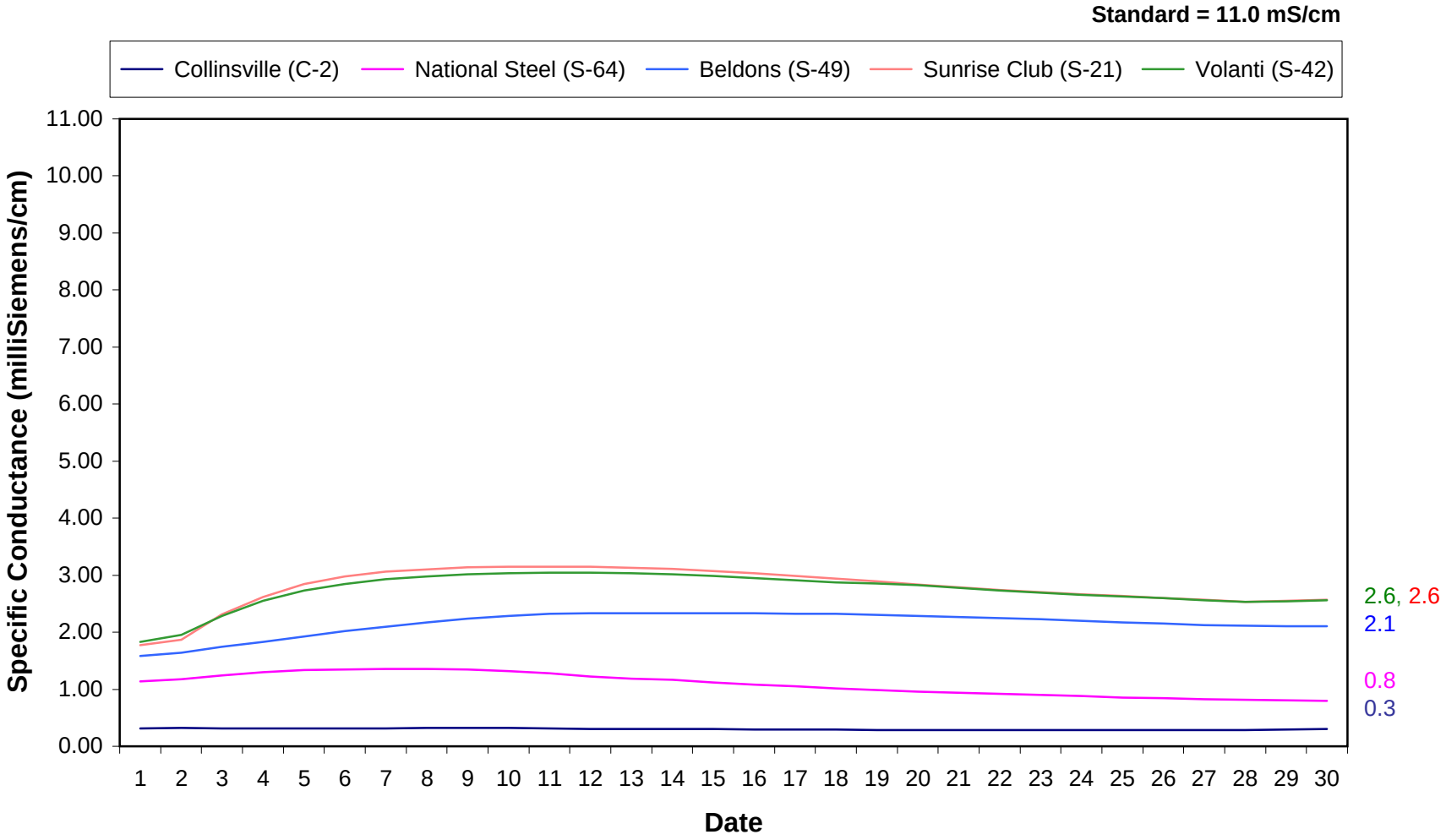


Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
April 2004

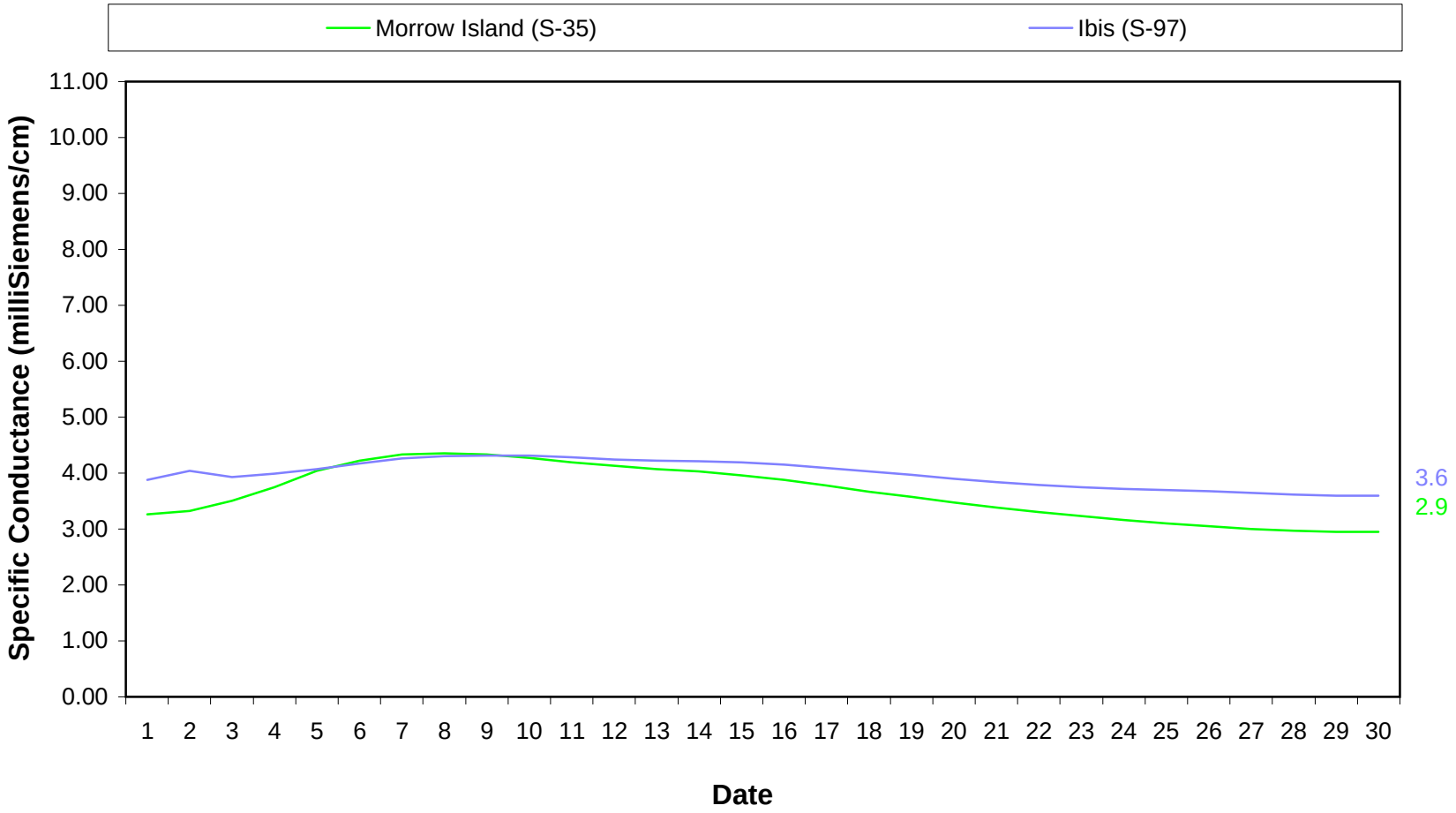
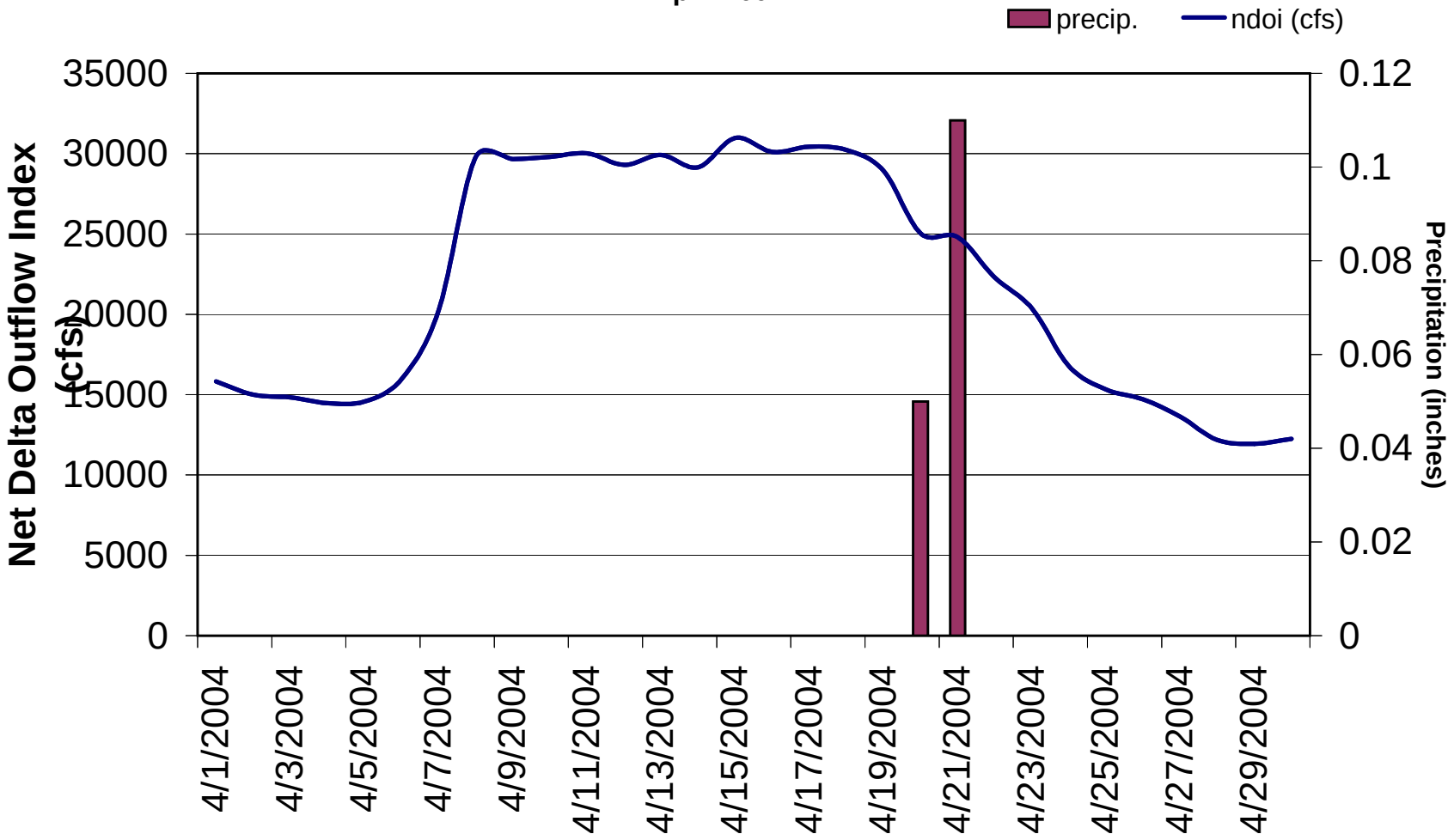


Figure 3. Daily Net Delta Outflow Index and Precipitation*
April 2004



*Preliminary DWR, O&M data; no precip. observed in April 2004

Figure 4. Monthly Mean Specific Conductance at High Tide
Comparison of Monthly Values for Selected Stations
April of 1995-2004

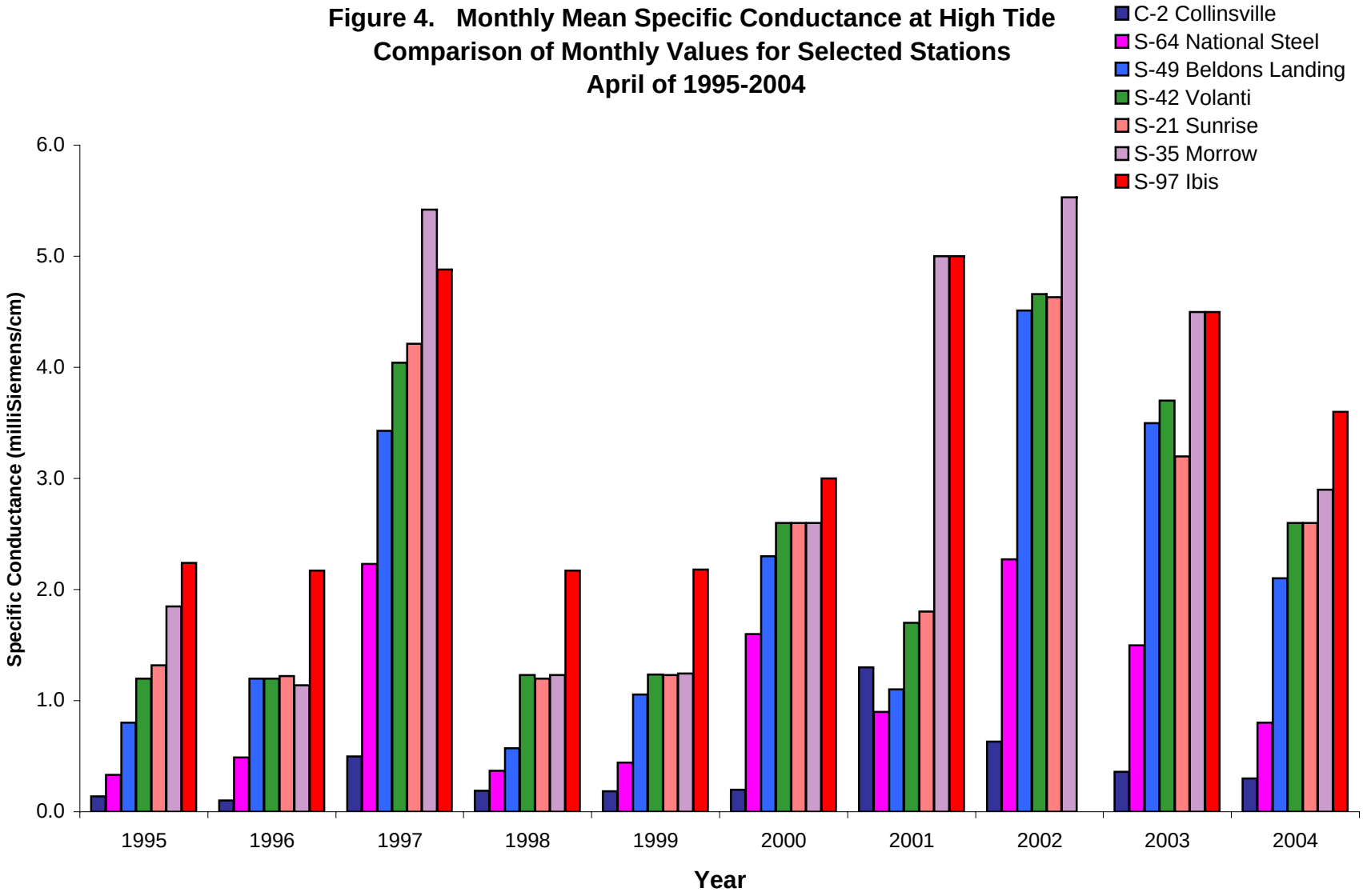
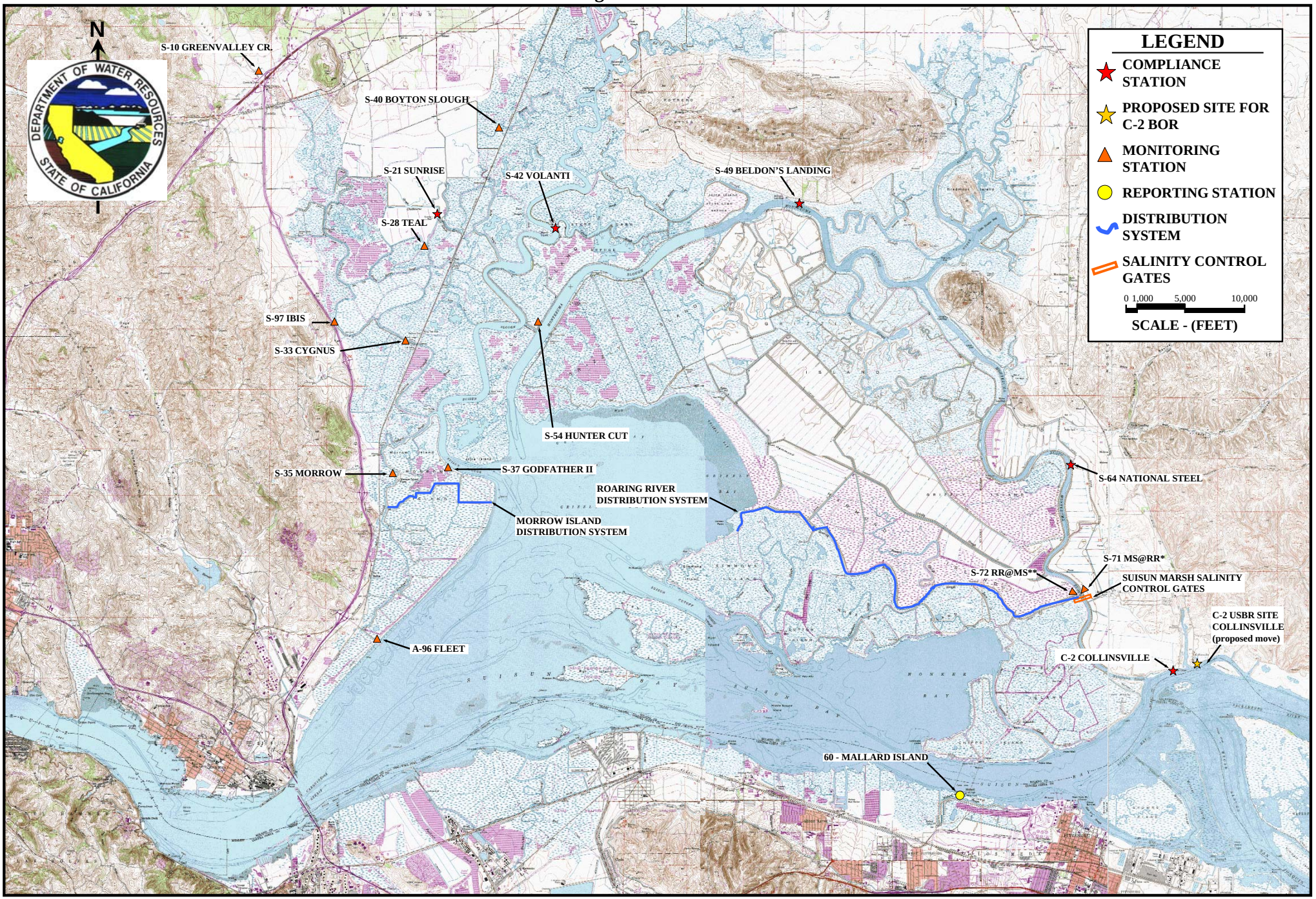


Figure 5



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES